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Shinichiro Isobe

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EXAMINER

YANG, JAY

ART UNIT

PAPER NUMBER

4132

MAIL DATE

DELIVERY MODE

06/03/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/584,313	<b>Applicant(s)</b> ISOBE, SHINICHIRO	
	<b>Examiner</b> JACK YANG	<b>Art Unit</b> 4132	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 June 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

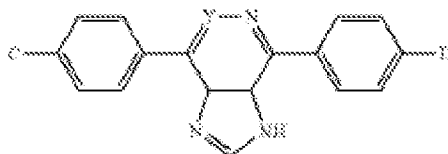
## DETAILED ACTION

### ***Claim Rejections – 35 USC § 112***

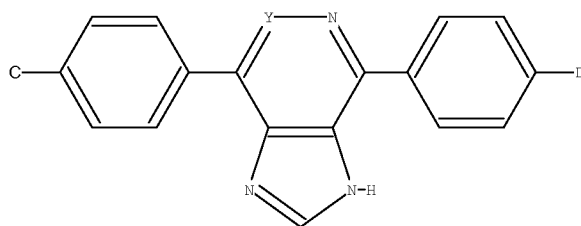
1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 5 states that the light-emitting group Y is an imidazole derivative represented by the following general formula:



However, the imidazole is missing a double bond between the carbon atoms at the fused intersection resulting in a non-aromatic compound. For this examination, light-emitting group Y will be assumed to be:



3. Claim 6 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 6 initially states that R<sub>3</sub> represents an aromatic hydrocarbon group optionally having a substituent along with R<sub>1</sub>, R<sub>2</sub>, and R<sub>4</sub>. However, Claim 6 subsequently states that R<sub>3</sub> represents a hydrogen atom, a cyano group, a

carboxyl group, an amide group optionally having a substituent, an ester group optionally having a substituent, an alkyl group optionally having a substituent, an aromatic hydrocarbon group optionally having a substituent, or a heterocyclic group optionally having a substituent. For this examination, R<sub>3</sub> will be assumed to represent a species chosen from the latter (hydrogen, ..., and heterocyclic group optionally having a substituent).

***Claim Rejections – 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

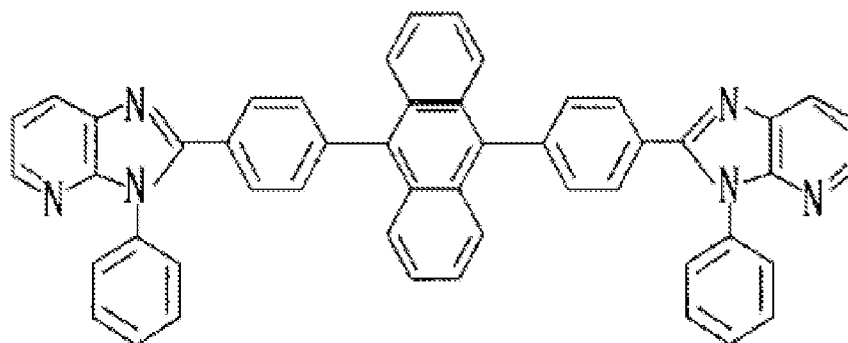
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

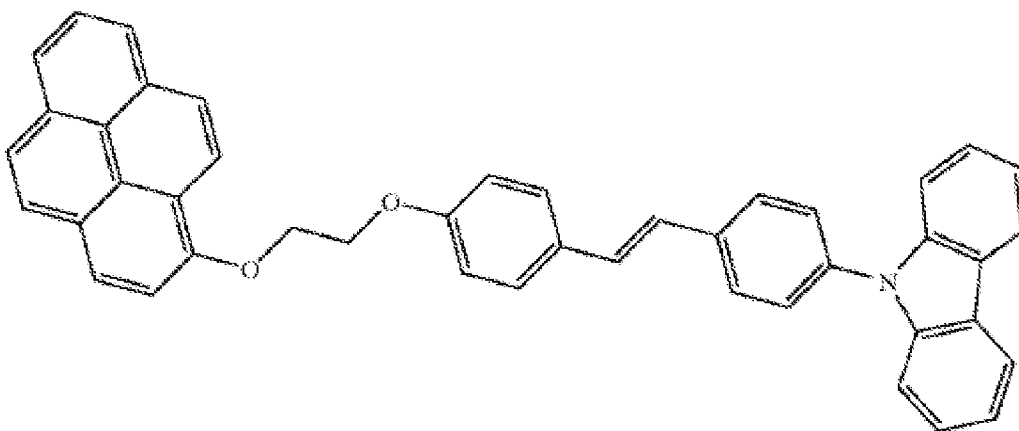
2. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Okada (JP 2003-217856 A). Okada discloses an organic EL device containing two or more organic compound layers including an emission (luminous) layer and an electron transport layer between a pair of electrodes ([0007]). Okada discloses that the organic EL device in those layers can contain the following light-emitting (Claim 1) compound:

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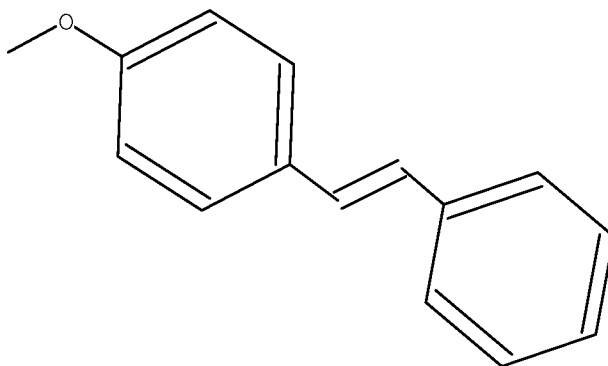


([0089]) such that in the formula  $(Y-L)_nX_m$ ,  $m = 1$ ,  $n = 2$ ,  $L = \text{phenyl}$ ,  $X = \text{anthracene}$ , and  $Y = \text{imidazole derivative}$ .

3. Claim 3 is rejected under 35 U.S.C. 102(a) and 102(e) as being anticipated by Li et al. (US 2004/0219387). Li et al. discloses an organic EL device comprising an emission layer that is between the cathode and the anode (Figure 1). Li et al. discloses the following compound that can be in the emission layer:



such that in the formula  $(Y-L)_nX_m$ ,  $n = 1$ ,  $m = 1$ ,  $X = \text{pyrene}$ ,  $Y = \text{polycyclic aromatic (carbazole)}$ ,  $A_1 = \text{oxygen}$ ,  $R_1 = \text{alkylene spacer group } CH_2$ , and  $A_2 = \text{ether group}$  as shown below:

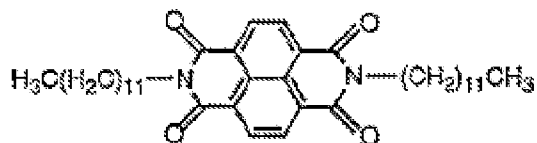


***Claim Rejections – 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okada (JP 2003-217856 A) and further in view of Hong et al. (Synthetic Metals 82 (1996) 189-191). Okada discloses the organic EL device according to Claim 1 as shown above in the 102(b) rejection. Okada however does not disclose an electron-transporting group where X = naphthalenediimide group or a phenyldiimide group. Hong et al. discloses the following compound:

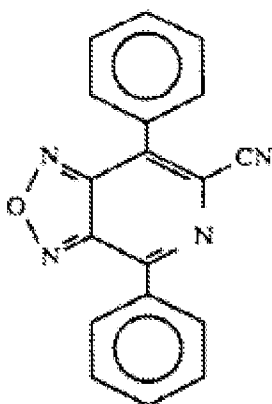


as useful electron-transporting material for light-emitting diodes (**3**, p. 189). Since each

individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the naphthalenediimide group as disclosed by Hong et al. Thus a simple substitution of one known element for another producing a predictable result results the claim obvious.

3. Claims 4 and 6 are rejected under U.S.C. 103(a) as being unpatentable over Okada (JP 2003-217856 A) and further in view of Tashiro et al. (US 5,059,863 A).

Regarding Claim 4, Okada discloses the organic EL device according to Claim 1 as shown above in the 102(b) rejection. Okada however does not disclose any oxadiazolopyridine derivatives as the light-emitting group Y as described in the present claim. Tashiro et al. discloses the following organic luminescent compound:



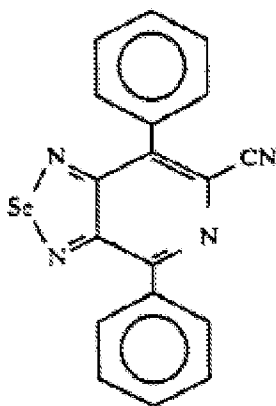
(col. 7, (9)) as material for the organic luminescent layer such that  $R_1 = R_2 = \text{phenyl}$ .

Tashiro et al. further discloses that the cyanide group can be replaced by hydrogen (col. 2, lines 14-15). Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed

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subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the organic luminescent compound shown above as disclosed by Tashiro et al. Thus a simple substitution of one known element for another producing a predictable result results the claim obvious.

Regarding Claim 6, Okada discloses the organic EL device according to Claim 1 as shown above in the 102(b) rejection. Okada however does not disclose any oxa(thia)diazolopyridine derivatives as the light-emitting group Y as described in the present claim. Tashiro et al. discloses the following organic luminescent compound:

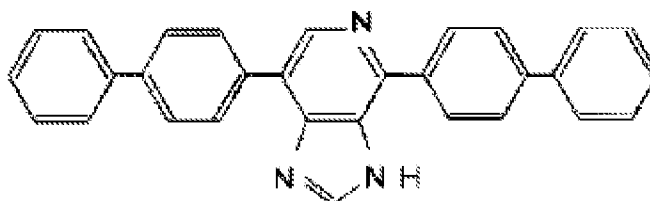


(col. 7, (10)) as material for the organic luminescent layer such that X = Se, R<sub>1</sub> = R<sub>2</sub> = phenyl, and R<sub>3</sub> = cyanide. Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the organic luminescent compound shown above as disclosed by Tashiro et al. Thus a simple substitution of one known element for another



producing a predictable result results the claim obvious.

4. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okada (JP 2003-217856 A) and further in view of Mataga et al. (JP 2003-133072 A). Okada discloses the organic EL device as shown above in the 102(b) rejection. Okada however does not disclose any imidazole derivatives as the light-emitting group Y as described in the present claim. Mataga et al. discloses the following compound:

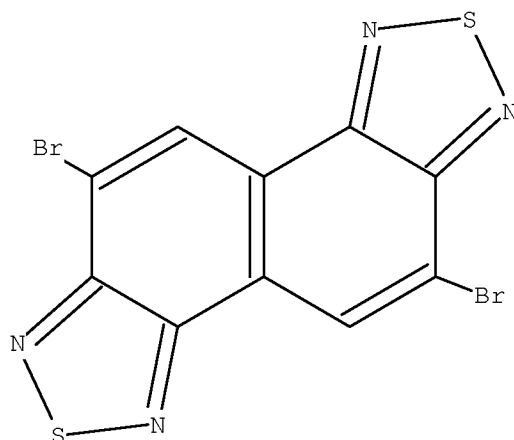


([0066], (17)) as a light-emitting element in an organic EL device such that Y = carbon atom (no substituent) and C = D = phenyl. Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the organic luminescent compound shown above as disclosed by Mataga et al. Thus a simple substitution of one known element for another producing a predictable result results the claim obvious.

5. Claim 7 is rejected under U.S.C. 103(a) as being unpatentable over Okada (JP 2003-217856 A) and further in view of Tashiro et al. (JP 2000-282024 A). Okada discloses the organic EL device as shown above in the 102(b) rejection. Okada

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however does not disclose any thiadiazole derivatives as the light-emitting group Y as described in the present claim. Tashiro et al. discloses the following compound:

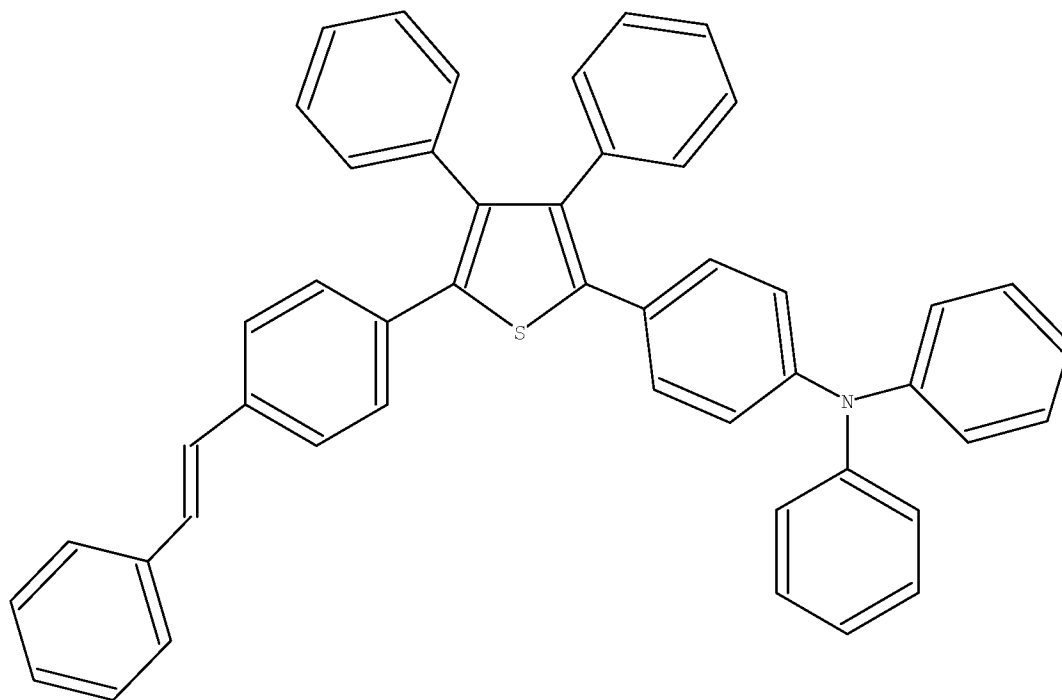


(Table 1) as a strong fluorescent dopant in the organic electron-transporting layer (ETL) and/or the hole-transporting layer (HTL) ([0029]) such that  $X = \text{Br}$  and  $R_1 = R_2 = \text{a hydrogen atom}$ . Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the organic luminescent compound shown above as disclosed by Tashiro et al. Thus a simple substitution of one known element for another producing a predictable result results the claim obvious.

6. Claim 8 is rejected under U.S.C. 103(a) as being unpatentable over Okada (JP 2003-217856 A) and further in view of Ishida et al. (JP 2003-157977 A). Okada discloses the organic EL device as shown above in the 102(b) rejection. Okada however does not disclose any 2,3,4,5-tetraphenylthiophene derivatives as the light-

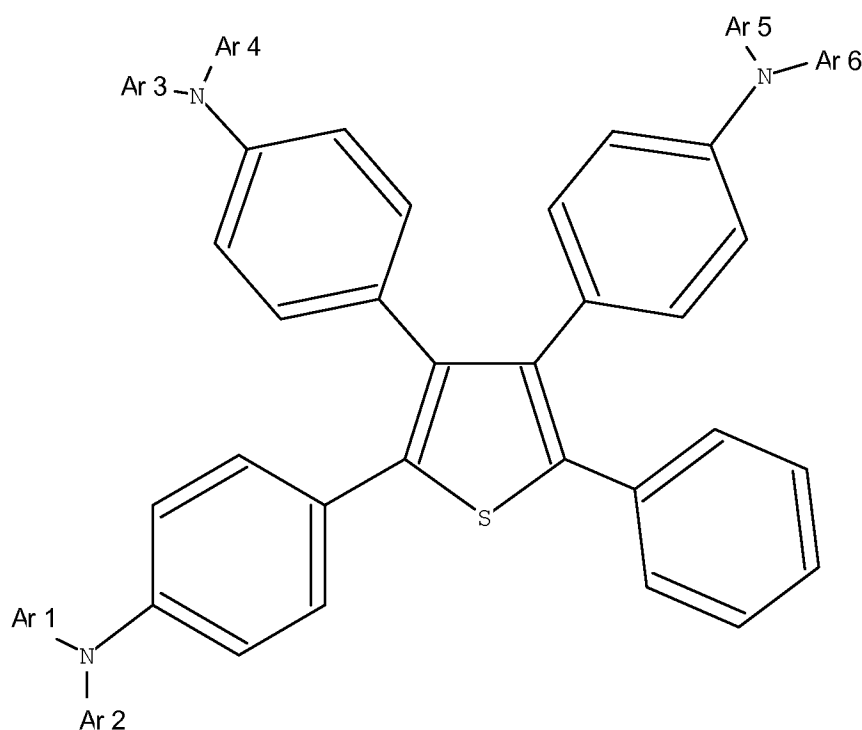
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emitting group Y as described in the present claim. Ishida et al. discloses the following compound:



(A-1) to use as light-emitting element in an organic EL device such that  $R_{12} = R_{14} =$  hydrogen,  $R_{13} =$  phenyl,  $Ar_1 = Ar_2 =$  phenyl,  $Y_1 = Y_2 =$  hydrogen. Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the organic luminescent compound shown above as disclosed by Ishida et al. Thus a simple substitution of one known element for another producing a predictable result results the claim obvious.

7. Claim 9 is rejected under U.S.C. 103(a) as being unpatentable over Okada (JP 2003-217856 A) and further in view of Nakatsuka et al. (JP 2003-151778 A). Okada discloses the organic EL device as shown above in the 102(b) rejection. Okada however does not disclose any 2,3,4,5-tetraphenylthiophene derivatives as the light-emitting group Y as described in the present claim. Nakatsuka et al. discloses the following compound:



(1) where Ar<sub>1</sub>-Ar<sub>5</sub> = aryl group as a light-emitting element in an organic EL device ([0043]). Since each individual element and its function is known in the prior art, albeit shown in separate references, the difference between the claimed subject matter and the prior art rests not on any individual element or function but in the very combination itself – that is the substitution of the anthracene (or any X group) as disclosed by Okada for the organic luminescent compound shown above as disclosed by Nakatsuka et al.

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Thus a simple substitution of one known element for another producing a predictable result results the claim obvious.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JACK YANG whose telephone number is (571)270-1137. The examiner can normally be reached on Monday to Thursday from 8:30 am to 6:00 pm Eastern.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike LaVilla can be reached on 571-272-1539. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/JACK YANG/  
Examiner, Art Unit 4132

/Milton I. Cano/  
Supervisory Patent Examiner, Art Unit 4122